Amendments to the Claims:

This listing of claims will replace all prior versions, and listings, of claims in the application:

Listing of Claims:

1. (Currently Amended) A laminated signal line comprising:

two or more layers of non-conducting material;

~~one~~ two or more internal conductors, each of the internal conductors being sandwiched between adjacent ones of the two or more layers of non-conducting material; and

a conductive shield comprising:

a top conductor layer disposed atop the two or more layers of non-conducting material, and

opposed side wall conductors, electrically connected to the top conductor layer;

wherein the opposed side wall conductors are formed on walls of a pair of trenches that are formed through the two or more layers of non-conducting material on opposed sides of the ~~one~~ two or more internal conductors.

2. (Original) The laminated signal line of claim 1, wherein the conductive shield further comprises:

a bottom conductor layer disposed beneath the two or more layers of non-conducting material, the bottom conductor layer being electrically

connected to the top conductor layer and the opposed side wall conductors.

3. (Currently Amended) The laminated signal line of claim 2, wherein the top conductor layer, the opposed side wall conductors, and the bottom conductor layer are unitarily formed so that the conductive shield surrounds the ~~one~~ two or more internal conductors.

4. (Currently Amended) The laminated signal line of claim 3, wherein the ~~one~~ two or more internal conductors and the conductive shield are formed substantially of copper.

5. (Original) The laminated signal line of claim 1, wherein the pair of trenches are substantially parallel to one another.

6. (Currently Amended) The laminated signal line of claim 1, wherein the top conductor layer and the opposed side wall conductors are unitarily formed so that the conductive shield surrounds the ~~one~~ two or more internal conductors.

7. (Original) The laminated signal line of claim 1, further comprising:

a conductive connection pad connected to one end of one of the internal conductors, the pad being adapted for connection to an electrical device via soldering.

8. (Currently Amended) A laminated conductive tube comprising:

one or more layers of non-conducting material; ~~and~~

two or more internal conductors positioned within the one or more layers of non-conducting material; and

a shield comprising:

a top conductor layer disposed atop the one or more layers of non-conducting material,

a bottom conductor layer disposed beneath the two or more layers of non-conducting material, and

opposed side wall conductors, electrically connected to the top and bottom conductor layers;

wherein the opposed side wall conductors are formed on walls of a pair of trenches that are formed adjacent one another through the two or more layers of non-conducting material whereby the shield encapsulates the two or more internal conductors.

9. (Currently Amended) The laminated conductive tube of claim 8, wherein the top conductor layer, the opposed side wall conductors, and the bottom conductor layer are unitarily formed so that the shield surrounds the ~~one~~ two or more internal conductors.

10. (Original) The laminated conductive tube of claim 9, wherein the shield is formed substantially of copper.

11. (Original) The laminated conductive tube of claim 8, wherein the pair of trenches are substantially parallel to one another.

12. (Currently Amended) A printed circuit board comprising one or more laminated signal lines, wherein each of the signal lines comprises:

two or more layers of non-conducting material;

~~one~~ two or more internal conductors, each of the internal conductors being sandwiched between adjacent ones of the two or more layers of non-conducting material; and

a conductive shield comprising:

a top conductor layer disposed atop the two or more layers of non-conducting material, and

opposed side wall conductors, electrically connected to the top conductor layer;

wherein the opposed side wall conductors are formed on walls of a pair of trenches that are formed through the two or more layers of non-conducting material on opposed sides of the ~~one~~ two or more internal conductors.

13. (Original) The printed circuit board of claim 12, wherein the conductive shield further comprises:

a bottom conductor layer disposed beneath the two or more layers of non-conducting material, the bottom conductor layer being electrically connected to the top conductor layer and the opposed side wall

conductors.

14. (Currently Amended) The printed circuit board of claim 13, wherein the top conductor layer, the opposed side wall conductors, and the bottom conductor layer are unitarily formed so that the conductive shield surrounds the ~~one~~ two or more internal conductors.

15. (Original) The printed circuit board of claim 14, wherein the one or more internal conductors and the conductive shield are formed substantially of copper.

16. (Currently Amended) The printed circuit board of claim 12, wherein the top conductor layer and the opposed side wall conductors are unitarily formed so that the conductive shield surrounds the ~~one~~ two or more internal conductors.

17. (Original) The printed circuit board of claim 13, further comprising:

a conductive connection pad connected to one end of one of the internal conductors, the pad being adapted for connection to an electrical device via soldering.

18. (Original) The printed circuit board of claim 12, further comprising:

a plated-through hole connected to one end of one of the internal conductors, the plated-through hole being formed through the printed circuit board.

19. (Original) A shielded interconnect structure for interconnecting plural devices on a printed circuit board, the shielded interconnect structure comprising:

plural first level conductive traces, disposed on an upper surface of the printed circuit board, each first level conductive trace being adapted for electrical connection to one or more of the plural devices;

plural second level conductive traces, disposed on a buried level of the printed circuit board;

plural micro-vias providing electrical connection from selected ones of the first level conductive traces to selected ones of the second level conductive traces;

one or more third level conductive traces, disposed on a further buried level of the printed circuit board;

plural buried vias providing electrical connection from the third level conductive traces to certain ones of the second level conductive traces;

a conductive shield comprising;

a top shield layer disposed on an upper surface of the printed circuit board, a conductive side wall, electrically connected to the top shield layer, and

a bottom shield layer, electrically connected to the conductive side wall, buried within the printed circuit board at a level beneath the further buried level;

wherein a trench is formed in the printed circuit board surrounding the first level conductive traces, the second level conductive traces, and the third level conductive traces, the conductive side wall being formed on a wall of the trench.

20. (Original) The shielded interconnect structure of claim 19, wherein the top shield layer, the conductive side wall, and the bottom shield layer are formed so that the conductive shield is a unitary Faraday cage surrounding the second level conductive traces and the third level conductive traces.

21. (Original) The shielded interconnect structure of claim 19, wherein the conductive shield and the first, second, and third level conductive traces are formed substantially of copper.

22. (Currently Amended) A method of forming a shielded waveguide in a laminated printed circuit board, the method comprising:

forming a bottom shield layer on a non-conductive substrate;

forming a first non-conductive layer over the bottom shield layer;

patterning ~~an~~ two or more internal conductors atop the first non-conductive layer;

forming a second non-conductive layer over the patterned internal conductors and the first non-conductive layer;

forming a top shield layer atop the second non-conductive layer;

forming a pair of trenches through the first and second non-conductive layers on opposed sides of the internal conductors; and

disposing conductive material on walls of the trenches, extending from the bottom shield layer to the top shield layer.

23. (Original) An inductor comprising:

one or more layers of non-conducting material with a pair of trenches formed adjacent one another through the one or more layers of non-conducting material;

a conductive tube, wherein the conductive tube comprises:

a top conductor layer disposed atop the one or more layers of non-conducting material, between the pair of trenches,

a bottom conductor layer disposed beneath the two or more layers of non-conducting material, between the pair of trenches, and

opposed side wall conductors, electrically connected to the top and bottom conductor layers, wherein the opposed side wall conductors are formed on walls of the pair of trenches;

a first end lead formed as an extension of the top conductor layer; and

a second end lead formed as an extension of the bottom ~~side~~ conductor.

REMARKS

The Office Action dated March 17, 2003 has been reviewed. Claims 1-23 are currently pending in the patent application. Claims 1-18, and 22 have been amended to more clearly define Applicant's inventive concept. Claims 19-21 were allowed in the Office Action. Claim 23 is believed to be patentable over the art of record as originally submitted. In view of the following remarks, it is Applicant's belief that the above-referenced patent application is in condition for allowance.

Claim Rejections - 35 USC § 102

Claims 1-6, 9-18 and 22 and 23 were rejected under 35 USC 102(e) as being anticipated by U.S. Patent No. 5,677,515 (hereafter Selk).

Independent claims 1, 8, 12, and 22 were amended to recite two or more internal conductors. Selk does not teach the arrangements recited in claims 1,8, 12 and 22 having two or more internal conductors.

That is, as discussed by the Examiner, Selk teaches a shielded printed wiring board which provides electrical and magnetic isolation for the signal layers thereon. Grooves are routed through the printed circuit board on both sides of each signal layer (see abstract) extending from the top layer partially through to the conductive layer. Figure 2 of Selk shows three separate signal lines 34, 36 and 38 that are constructed in parallel and located within a single signal layer printed wiring board (see col. 3, lines 45-47). However, there is only one signal line positioned between

each pair of plated grooves.

Fig. 3(a) of Selk shows an exploded cross-sectional view of a shielded dual signal layer printed wiring board 40. The shielded dual signal layer printed wiring board includes a first shielded signal layer 42, and a second shielded signal layer 44. However, Selk does not provide a shield which encompasses two or more internal conductors so that the two or more signals layers or components are shielded from other components. For example, two plated grooves 72 and 74 are provided on either side of the second shielded signal layer 44. Two plated groves 72' and 74' are provided on either side of the first signal layer 42. (See Col. 4, lines 61-65)

With respect to claim 23, it is stated in the Office Action that Selk discloses in Figure 1 a first end lead formed as an extension of the top conductor layer, and a second end lead formed as an extension of the bottom side conductor. An example of the arrangement referred to in claim 23 is shown in Figure 12 of the present application. Applicant's attorney has reviewed Figure 1 of Selk and cannot locate any teaching of the first end lead and the second end lead. It would be helpful if the Examiner would indicate in Figure 1 where these two features are shown.

In light of the foregoing, it is Applicant's belief that each and every rejection has been overcome. Reconsideration and withdrawal of the rejection of claims 1-6, 9-18 and 22-23, as amended, is respectfully requested.

Claim R j ctions - 35 USC § 103(a)

Claim 7 and 17 were rejected under 35 USC § 103(a) as being unpatentable over Selk in view of US 5,659,953 (hereafter Crane). The rejection of claims 7 and 17, as amended, is respectfully traversed. Claims 7 and 17 depend from independent claims 1 and 13. Claims 1 and 13 were amended to recite two or more internal conductors, as discussed above. Selk does not teach or suggest the arrangement recited in independent claims 1 and 13. Crane is not believed to supply the deficiencies of Selk. Therefore, the combination of Selk and Crane do not provide a prima facie case of obviousness with respect to claims 7 and 17, as amended. Reconsideration and withdrawal of the rejection of claims 7 and 17, as amended, is respectfully requested.

Summary

The foregoing is intended to be a complete response to the Office Action mailed March 17, 2003. Reconsideration and withdrawal of the rejections is respectfully requested. Should the Examiner have any questions or comments regarding the foregoing, Applicant's attorney would welcome a telephonic interview with the Examiner.

Respectfully Submitted,

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